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09/932,055	08/16/2001	Simon Dodd	10007744-1	5019

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EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 01/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/932,055

Applicant(s)

DODD, SIMON

Examiner

Lynett T. Umez-Eronini

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 15-20 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-13 and 15-26 is/are allowed.
- 6) ☒ Claim(s) 11-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Specification***

1. The amendment filed 10/18/2004 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: Although the Specification ([0050] - [0057]) discloses a method of forming a thermal inkjet printhead that include a substrate and a trench as well as drop generator components for ejecting drop of ink from the substrate, it fails to provide support for: "wherein the trench extend from a surface of the substrate on which the layer is provided only part of the way through the substrate," as recited in independent claim 11.

Applicant is required to cancel the new matter in the reply to this Office Action.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation, "wherein the trench extends from a

surface of the substrate on which the layer is provided only part of the way through the substrate" is not supported by the Specification.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 11 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawamura (US 6,019,907).

Kawamura teaches a method of forming an inkjet printhead comprising the steps of: forming a hard mask **54** (same as applicant's oxide layer) and photoresist layer on a silicon die and etching a first and second trench through the die or to a prescribed depth (column 5, lines 27-57 and FIG. **6B** and **6C**), which read on,

A method of fabricating multiple layer of a thermal inlet printhead that includes a substrate and a trench for moving ink across the substrate, as well as drop generator components for ejecting drops of ink from the substrate, comprising the steps of:

providing a layer on the substrate to serve as a drop generator component; and as a mask to define the trench for etching; and then

etching the substrate to form the trench in the substrate, wherein the trench extends from a surface of the substrate on which the layer is provided only part of the way through the substrate, **in claim 11**.

Since Kawamura teaches the using the same materials in forming layers on a substrate as the claimed invention, then using Kawamura method of forming a layer on a substrate in the same manner as the claimed invention would result in a layer on the substrate to serve as a mask to define the trench for etching and a layer or passivation material to serve as both a drop generator component and mask, **in claim 14.**

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura (US '907) as applied to claim 11 above.

Kawamura differs in failing to teach growing a layer of oxide to serve as a transistor gate component of the drop generator as well as the mask.

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to use a conventional method of forming a gate electrode by growing or depositing an oxide layer on a semiconductor in fabricating a transistor, which comprises a source region, drain region, and gate electrode and using a conventional photolithographic method in growing a silicon oxide layer to form a hard mask.

Art Unit: 1765

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura (US '907) as applied to claim 1 above, and further in view of Hawkins (US 4,863,560).

Kawamura differs in failing to teach capping the oxide layer near the trench with a layer of passivation material.

Hawkins teaches a  $\text{SiO}_2$  26 layer is lithographically processed to form a via 23 on a silicon wafer 19; a  $\text{Si}_3\text{N}_4$  layer 28 is deposited over the patterned  $\text{SiO}_2$  26 layer and the exposed silicon wafer surface 22 and the  $\text{Si}_3\text{N}_4$  layer 28 is then lithographically processed to produce via 24, so that via 24 exposes the bare silicon surface 22 of wafer 19. Hawkins further teaches, "Note that a border 29 of  $\text{Si}_3\text{N}_4$  (see FIG. 5) is left about 1 mil wide inside of the  $\text{SiO}_2$  via 23 both for protection and limitation of undercutting during subsequent ODE (orientation etching) processing (column 5, lines 43-64), which reads on, capping the oxide layer near the trench with a layer of passivation material.

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Kawamura by using Hawkins method of capping an oxide layer near the trench for the purpose of protection and limitation of undercutting during subsequent ODE processing (column 5, lines 61-64).

***Allowable Subject Matter***

9. Claims 1-10 and 23-26 are allowed.

10. The following is a statement of reasons for the indication of allowable subject matter:

Art Unit: 1765

As to claims 1, 2, 4, 21 and 22, applicant's Remarks (June 8, 2004, page 8) were persuasive to show the prior art of record taken alone or in combination fails to teach, suggest, or render obvious masking a first portion of a substrate surface with passivation material having edges that define boundaries on the substrate surface such that within the boundaries a second surface portion is exposed for etching, in combination with the other limitations of the said claims;

As to claim 3, the prior art of record taken alone or in combination fails to teach, suggest, or render obvious masking a substrate surface with the passivation material includes simultaneous deposition of the passivation material at a location away from the exposed surface portion to enable use of some of the passivation material as one of the drop generator layers as well as the mask, in the sequence of steps in a method of etching a substrate surface, along with the other limitations of the said claim;

As to claim 5, the prior art of record taken alone or in combination fails to teach, suggest, or render obvious the sequence of steps: comprising masking a first portion of a substrate surface with passivation material having edges that define boundaries on the substrate such that within the boundaries a second surface portion is exposed for etching; depositing a metal layer over the passivation material; and then etching the second surface portion, in combination with the other limitations of the said claim;

As to claims 6-10, applicant's Remarks (in Amendment filed 6/8/2004, on pages 9-10) were persuasive to show the prior art of record taken alone or in combination fails to teach, suggest, or render obvious a method of masking and etching a surface of a silicon substrate, comprising the steps of: providing on the substrate surface a patterned

Art Unit: 1765

oxide layer having edges that define boundaries of a surface portion such that within and adjacent to the boundaries the surface portion is exposed for etching; covering the oxide layer near the edges with passivation material; and etching the entire surface portion of the silicon substrate that is exposed for etching, in combination with the other limitations of the above claims; and

As to claims 23-26, the prior art of record taken alone or in combination fails to teach, suggest, or render obvious a method of etching a substrate surface comprising: depositing a passivation material on a first portion of the substrate surface and subsequently removing a portion of the deposited passivation material from a second portion of the substrate surface within the first portion, such that the second portion is free of passivation material; depositing a metal over the passivation material; and etching the second portion, in claim 23 and in combination with the rest of the limitations of claims 24-26.

### ***Response to Arguments***

11. Applicant's arguments with respect to claims 11-14 have been considered but are moot in view of the new ground(s) of rejection because the prior art of record fail to teach a method of fabricating multiple layers of a thermal inkjet printhead wherein the trench extends form a surface of the substrate on which the layer is provided only part of the way through the substrate, as recited in independent claim 11.



***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1765

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ltue

January 6, 2005

**NADINE G. NORTON**  
**SUPERVISORY PATENT EXAMINER**

